at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein each input bin has at least one associated spatial direction; and

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure; and wherein

said weightings are chosen to minimize interference to unintended receivers.

225. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein each input bin has at least one associated spatial direction; and

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure; and wherein

said weightings are chosen based on characterization of an undesired signal subspace and a desired signal subspace.

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226. (NEW) The transmitter system of claim 225 wherein said characterizations of said desired signal subspace and said undesired signal subspace are averaged over at least one of time and frequency.

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227. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions; and

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure and wherein said at least two spatial directions are the same for all of said input bins.

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228. (NEW) The transmitter system of claim 227 further comprising:

a system input that receives a group of input symbols wherein each input symbol corresponds to a particular input bin of said time domain substantially orthogonalizing procedure and a particular one of said at least two spatial directions; and wherein

said at least one processing element applies said time domain substantially orthogonalizing procedure to said group of input symbols independently to symbols corresponding to each of said at least two spatial directions; and wherein

said spatial processor, for each independent application of said time domain substantially orthogonalizing procedure, applies one of said weightings to output of said time domain substantially orthogonalizing procedure, each of said weightings being defined by the particular spatial direction associated with each application of said time domain orthogonalizing procedure and being the same for each output bin of said time domain substantially orthogonalizing procedure.

229. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure is applied independently for each of said input bins.

230. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure is applied independently for each of said spatial directions.

231. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure is applied independently for each of said subchannels.

232. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure is applied independently for each of said subchannels.

233. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure comprises a turbo coding procedure.

234. (NEW) A transmitter system for transmitting via a plurality of inputs to a channel, said transmitter system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into input bins;

a spatial processor employing weightings among said channel inputs to define spatial directions wherein there are at least two spatial directions;

wherein said transmitter system transmits information in subchannels of said channel, each of said subchannels being defined by a combination of input bin and spatial direction, by employing said at least one processing element for at least two independent applications of said time domain substantially orthogonalizing procedure;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to define contributions to each of said channel inputs; and

wherein said at least one processing element independently applies said substantially orthogonalizing procedure to output of said spatial processor independently for each of said channel inputs;

an encoder that applies a coding procedure to inputs to said spatial processor; and

wherein said coding procedure belongs to a group consisting of:

convolutional coding, Reed-Solomon coding, CRC coding, block coding, and interleaving.

235. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

and wherein said weightings are chosen to minimize interference from undesired transmitters.

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236. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

and wherein said weightings are chosen based on characterization of a desired signal subspace and an undesired signal subspace.

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237. (NEW) The transmitter system of claim 236 wherein said characterizations of said desired signal subspace and said undesired signal subspace are averaged over at least one of time and frequency.

238. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

and wherein said at least two spatial directions are the same for all of said output bins.

239. (NEW) The transmitter system of claim 238 further comprising:

a system input that receives input time domain symbols via said channel outputs;

wherein said at least one processing element applies said time domain substantially orthogonalizing procedure to said input symbols independently for each of said at least two spatial directions; and

wherein said spatial processor, applies ones of said weightings to said input time domain symbols to develop input to said independent applications of said time domain substantially orthogonalizing procedure, each of said weightings being defined by a corresponding one of said at least two spatial directions, and being the same for each input bin of said time domain substantially orthogonalizing procedure.

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240. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

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wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

wherein said at least one processing element applies said substantially orthogonalizing procedure independently for each of said channel outputs;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to output of said at least one processing element to define contributions from each of said channel outputs; and

a decoder that applies a decoding procedure to outputs from said spatial processor; and

wherein said decoding procedure is applied independently for each of said spatial directions.

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241. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

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at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

wherein said at least one processing element applies said substantially orthogonalizing procedure independently for each of said channel outputs;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to output of said at least one processing element to define contributions from each of said channel outputs; and

a decoder that applies a decoding procedure to outputs from said spatial processor; and

wherein said decoding procedure is applied independently for each of said output bins.

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242. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

wherein said at least one processing element applies said substantially orthogonalizing procedure independently for each of said channel outputs;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to output of said at least one processing element to define contributions from each of said channel outputs; and

a decoder that applies a decoding procedure to outputs from said spatial processor; and

wherein said decoding procedure is applied independently for each of said subchannels.

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~~243~~. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and

wherein said receiver system receives information via subchannels of said channel, by employing at least two independent parallel applications of said substantially orthogonalizing procedure by said at least one processing element, each of said subchannels being defined by a combination of output bin and spatial direction;

wherein said at least one processing element applies said substantially orthogonalizing procedure independently for each of said channel outputs;

wherein said spatial processor, for each of said spatial directions applies one of said weightings to output of said at least one processing element to define contributions from each of said channel outputs; and

a decoder that applies a decoding procedure to outputs from said spatial processor; and

wherein said decoding procedure is based on one of:

convolutional coding, trellis coding, Reed-Solomon coding, CRC coding, block coding, and interleaving.

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244. (NEW) A receiver system for receiving via a plurality of outputs from a channel, said receiver system comprising:

at least one processing element that applies a time domain substantially orthogonalizing procedure to divide said channel into output bins;

a spatial processor employing weightings among said channel outputs to define spatial directions wherein each output bin has at least one associated spatial direction; and